Effectiveness of Health Education on Self-care and Self-efficacy of Patients with Coronary Heart Disease: A Systematic Review

Rita[1], Azizah Khoiriyati[1], Erna Rochmawati[1]

[1]Master of Nursing Universitas Muhammadiyah Yogyakarta

Email correspondence: azizah.khoiriyati@umy.ac.id

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Abstract

Coronary heart disease is a leading cause of morbidity and mortality worldwide. Health education is needed to improve patient self-care and self-efficacy. This research aims to synthesize the literature on health education, focusing on self-care outcomes and self-efficacy among patients with coronary heart disease. A systematic review was conducted through a literature search on ScienceDirect, PubMed, Wiley Online Library, and Scopus. The search strategy used a combination of keywords with the Boolean operators "AND" and "OR." Study selection was performed by screening titles, abstracts, and full texts in Rayyan. The methodological quality of articles meeting the inclusion criteria was assessed using the Joanna Briggs Institute (JBI) instrument. Of the 3,520 identified articles, five studies with a total of 958 coronary heart disease patients met the inclusion criteria. The interventions evaluated included diversified and staged health education, eHealth cardiac rehabilitation, a workbook in health education, web-based education, and problem-based learning. Overall, Diversified and Staged Health Education, eHealth Cardiac Rehabilitation, and Workbook in Health Education were effective in improving self-care and self-efficacy. Furthermore, a problem-based educational approach had a positive impact on self-efficacy. Findings indicate that multifaceted and phased health education effectively improves self-care, and eHealth cardiac rehabilitation and workbooks in health education have been shown to increase self-efficacy in patients with coronary heart disease. These improvements in self-care and self-efficacy have the potential to support cardiovascular risk factor management and improve patient health outcomes. Health education based on diversified and staged health education, eHealth cardiac rehabilitation, and workbook in health education is effective in improving self-care and self-efficacy in coronary heart disease patients. Integrating these interventions into coronary heart disease service standards has the potential to improve the quality of care, prevent complications, and reduce the risk of rehospitalization.

Keywords: Coronary Heart Disease, Health Education, Self-Care, Self-Efficacy.

INTRODUCTION

Coronary heart disease (CHD) is a major global health problem, contributing significantly to global morbidity and mortality. The annual increase of approximately one million cases indicates that the burden of this disease continues to rise and poses a serious challenge to healthcare systems in many countries. The high incidence and impact have prompted the World Health Organization (WHO) to place greater emphasis on chronic disease management strategies, including strengthening self-care as a top priority to prevent complications and improve patients' quality of life (Tsao et al., 2022; World Health Organization, 2022).

Self-care and self-efficacy are important components in the management of coronary heart disease to maintain condition stability and prevent recurrent cardiovascular events (Bassola et al., 2025; Fereidooni et al., 2024; Mohamad et al., 2025). However, low self-care ability

remains a problem that increases the risk of recurrence, rehospitalization, complications, and decreased quality of life in patients (Kurniastining Fiqriyah & Hudiyawati, 2023).

Research (Di Matteo et al., 2025) reported that CHD patients often fail to achieve optimal self-care due to age and a high comorbidity burden, which contributes to increased mortality and 30-day readmission rates. This is in line with research (Marinho et al., 2023), which showed that poor self-care increases the risk of death within one year after hospitalization, with approximately 20% of patients being rehospitalized within 30 days of discharge. These findings underscore the important role of self-care in preventing rehospitalization.

According to a study (Abdelhameed & Nemer, 2022), self-care is a key component in the secondary prevention and management of heart disease because it helps prevent short-term and long-term complications. Factors such as self-efficacy, health literacy, knowledge of the disease, and social support influence the successful implementation of self-care. A systematic review (Kleman et al., 2024) found that self-efficacy, health literacy, knowledge about the disease, and social support were the main factors influencing successful self-care among heart patients. These factors were identified as key determinants of successful self-care in heart disease patients.

Patients with high self-efficacy tend to be better able to maintain medication adherence, manage their diet, engage in regular physical activity, and independently monitor symptoms. This relationship is reinforced by various studies showing that an individual's belief in their abilities plays a crucial role in shaping health behaviors and adherence to therapy (Mohammadzadeh et al., 2022; Rusiati & Koto, 2025). Furthermore, high self-efficacy is also associated with increased physical activity, medication adherence, and more effective dietary management in patients with chronic diseases, including CHD (Liu et al., 2023; Pahria et al., 2022; Tan et al., 2021).

In line with this, a systematic review (Leutualy et al., 2021) showed that education via text messaging (SMS) and telephone can improve health behaviors and reduce the risk of coronary heart disease. Other studies report that telenursing-based health education interventions effectively improve self-care skills in coronary artery disease patients and help maintain blood pressure, blood glucose levels, and adherence to healthy lifestyle changes, reducing the risk of recurrence and supporting more optimal disease control (Sugiharto, Haroen, et al., 2024; Sugiharto, Ubleeuw, et al., 2024).

In addition to telenursing, various other educational approaches, such as peer education and social media-based e-learning, have been reported to improve patients' capacity to perform

optimal self-care (Ebrahim El. Tahry et al., 2022; Svavarsdóttir et al., 2023; Weddell et al., 2025; Yu et al., 2022). However, various barriers remain in the implementation of self-care in CHD patients.

Research (Setyowati et al., 2024) shows that low knowledge, difficulty recognizing early symptoms, and a lack of educational support tailored to patients' cultural needs remain key inhibiting factors. This situation emphasizes the neccesity of effective health education to improve self-care and self-efficacy (Zhou et al., 2024). However, although the benefits of health education have been widely reported, the available interventions and research findings are still quite varied, so evidence regarding its effectiveness has not been comprehensively synthesized. Therefore, this review aims to synthesize evidence regarding the effectiveness of health education on self-care and self-efficacy in patients with coronary heart disease.

METHODS

The study adheres to the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). This systematic review has been registered with PROSPERO (CRD42025626883).

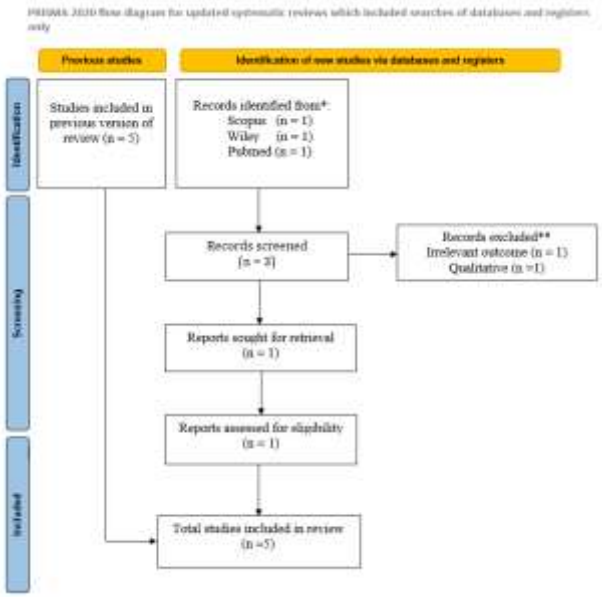

Figure 1. PRISMA Diagram

Searches were conducted in the ScienceDirect, PubMed, Wiley Online Library, and Scopus databases. Keywords were combined with “OR” and “AND” to develop a comprehensive search strategy limited to English-language articles. Only studies that met the inclusion criteria were included in this systematic review. The initial search was conducted in May 2025, so the database update was carried out in October 2025. The literature search

included "Coronary Heart Diseases" AND "Audio-Visual Media" AND "Patient Education" OR "Education" AND "Self-care" OR "Efficacy, Self".

RESULTS

The criteria used in the review include the following: inclusion criteria are (1) patients with a diagnosis of coronary heart disease, (2) telehealth, book, and literacy-based education, (3) control group and intervention group, (4) outcome of self-care or self-efficacy, (5) Randomized Controlled Trial (RCT) design studies, quasi-experimental, and (6) articles in English. Exclusion criteria: very heterogeneous population (patients with other heart diseases), protocol, observational, cross-sectional, review, and qualitative studies. The study selection process was carried out independently by screening the title and abstract, as well as full-text screening using Rayyan by two reviewers. Two reviewers independently assessed the quality of included studies using the Joanna Briggs Institute Instrument (Barker et al., 2023).

Each critical appraisal tool criterion was rated "yes," "no," "unclear," or "not available" by the reviewer for each study. Data findings were taken through studies included by two reviewers.

Table 1. Quality assessment of included studies

Quality assessment: quasi–experimental studies		**Nur'Aeni, A., et al. (2019)**
1.	There are 'causes' and 'effects'	v
2.	Is there a control group?	v
3.	Participants include similar comparisons	v
4.	Participants in the comparator who received treatment	v
5.	Any outcome measurements	v
6.	Results of participants included in the comparison	v
7.	Measurements are conducted using valid procedures	v
8.	Follow-up completed	v
9.	Statistical analysis is appropriate	v
Percentage Category		**100 % (H)**

Table 2. Quality assessment of RCT

	Quality assessment: RCT	**Kohler AK, et al. (2020)**	**Wong, E.M.-L., et al. (2020)**	**Shan, Z., et al. (2020)**	**Su, Jing Jing, et al. (2021)**
1.	Randomization for participant assignment	Y	Y	Y	Y
2.	Allocation hidden	Y	Y	N	Y
3.	The initial similar treatment	Y	Y	Y	Y
4.	Participants not aware of the assignment	Y	Y	Y	Y
5.	The person providing care does not know the assignment	Y	Y	Y	Y
6.	Treatment groups were treated identically	Y	Y	Y	Y
7.	Raters don't care about the assignment	N	Y	N	Y

	Quality assessment: RCT	Kohler AK, et al. (2020)	Wong, E.M.-L., et al. (2020)	Shan, Z., et al. (2020)	Su, Jing Jing, et al. (2021)
8.	Outcomes were measured in the same way for the treatment group	Y	Y	Y	Y
9.	Outcomes are measured in a reliable way	Y	Y	Y	Y
10.	Follow-up performed in full	Y	Y	Y	Y
11.	Participants were analyzed in groups	Y	Y	Y	Y
12.	Statistical analysis is appropriate	Y	Y	Y	Y
13.	Trial design appropriate	Y	Y	Y	Y
Percentage Category		**92 % (H)**	**100 % (H)**	**85 % (H)**	**100 % (H)**

Note: Quality scoring results with the JBI Critical Appraisal Checklist. The question with answers"Y"referred to"yes","N"referred to"no". A total score more than 80% was considered high quality (H), 60-80% was considered medium quality (M); and less than 60% was considered low quality (M) (Mostafaei et al., 2020).

Data were extracted independently by two reviewers from all included studies. The following information was collected for each included study: authors, year of publication, country/setting, study design, population, sample, intervention, outcome measures, and research results (Table 2). Disagreements were resolved through discussion with other reviewers. Research findings show varied interventions or high heterogeneity, so the findings do not allow for quantitative analysis or meta-analysis.

Table 3. Data extraction

Authors and Year	Country, setting	Methods	Population & Sample	Intervention	Research results and measurement
Shan et al. (2020)	Tiongkok, Department of Traditional Medicine	RCT	Population: 180. Intervention = 90, control = 90	Intervention: Three-phase education about coronary heart disease (information provision, material review, and knowledge assessment) conducted by doctors and nurses using a questionnaire from January 2018 to December 2019. Control: Routine care, without explanation of the duration of the education.	**Diversified and staged health education with self-care** significantly improved self-care in the intervention group compared to the control group (P < 0.05).

Nur'Aeni et al. (2019)	Indonesia, Cardiac intensive care unit	Quasi-experiment	Population 37. Intervention = 18, control = 19	Intervention: Health education was provided to patients, with self-efficacy assessed via telephone at two post-intervention assessments conducted one month after the pre-intervention assessment. Education was provided in person by a nurse or physician for two months using a questionnaire. Control: Patients received standard care.	**Workbook in health education with self-efficacy** showed a significant effect on self-efficacy at posttest 2 (p = 0.009)
Su & Yu (2021)	Tiongkok, Cardiology Unit at Hospital	RCT	Population 146. Intervention = 73, control = 73	The intervention in participants receiving NeCR showed an average website visit rate of 8.64 (SD = 1.53) times over 12 weeks, with interactive activities via WeChat attended by 52 participants, an average of 6.12 (SD = 1.05) times during the intervention period (questionnaire).	**eHealth cardiac rehabilitation with self-efficacy** showed significant changes in self-efficacy (β = 0.61, p = 0.005) compared to the group without special treatment at the end of the study.
Kohler et al. (2020)	Southeast Sweden, in Primary Health Care	RCT	Population 157. Intervention = 79, control = 78	The intervention was implemented through 13 scheduled sessions, each lasting 2 hours.	**Problem-based learning with self-efficacy** showed that comparisons

				The control group received a patient information brochure mailed to their home. Data collection was conducted over a one-year period by nurses using questionnaires.	between groups did not produce statistically significant differences.
Wong et al. (2020)	Hong Kong, at the Heart Clinic.	RCT	Population 438. Intervention = 219, and control = 219	A 20-minute individual educational intervention taught patients how to use the eHES website. The control group received conventional care. This care was administered over 6 months by trained research nurses (questionnaires).	**Web-based education with self-efficacy** did not have a significant effect on self-efficacy at 3 months (T2) or 6 months (T3).

The five participating journals showed variations in intervention methods and duration. The Diversified and staged health intervention studied by Shan et al. (2020) significantly improved self-care for coronary heart disease patients ($p<0.05$), while the Workbook in health education intervention by Nur'Aeni et al. (2019) showed an increase in self-efficacy (p-value 0.009). Furthermore, the eHealth cardiac rehabilitation method by Su & Yu (2021) found a statistically significant change in self-efficacy ($\beta = 0.61$, $p = 0.005$). In contrast, the Problem-based learning intervention conducted by Kohler et al. (2020) did not show significant effectiveness in improving self-efficacy. However, the study did show positive effects in the form of weight loss, increased Body Mass Index (BMI), and increased HDL cholesterol levels. The intervention by Wong et al. (2020) using the Web-based education method did not show an increase in effectiveness in self-efficacy of coronary heart patients (p-value = 0.17 and 0.90).

The study selection process was conducted in accordance with PRISMA guidelines, including identification, screening, eligibility assessment, and inclusion. A literature search across various databases yielded 3,520 articles after duplicates were removed. During the title and abstract screening stage, 3,508 articles were excluded due to inconsistencies with the established study population, intervention, outcome, or design. Twelve articles subsequently underwent full-text review.

During the full-text review phase, five articles were excluded because they were research protocols (n=1), qualitative studies (n=1), observational studies (n=1), cross-sectional studies (n=1), and studies focused on the development or validation of measurement instruments (n=1), leaving seven articles that met the initial eligibility criteria. Two articles were further excluded because their full texts were inaccessible, leaving five studies that met the inclusion criteria and were included in the final synthesis.

An updated literature search in October 2025 yielded three additional articles for review. Still, all were excluded because they did not meet the inclusion criteria for relevance to the outcome, methodological quality, or study design. Thus, the number of studies analyzed in this systematic review remained at five.

All included studies underwent a methodological quality assessment using the Joanna Briggs Institute (JBI) critical appraisal tools and received scores of 85%-100%, with a maximum score of 100%. There were no disagreements among the authors during the selection process or the quality assessment of the studies.

In general, the identified coronary heart disease (CHD) literature is still dominated by studies focusing on clinical outcomes such as mortality, readmissions, and physiological parameters, as well as by non-interventional designs. Studies specifically evaluating health education interventions on self-care outcomes and self-efficacy are limited. Despite the limited number of included studies, the consistently high methodological quality and strong alignment with the review's objectives indicate that the synthesized evidence remains robust and provides a credible and reliable basis for informing clinical practice and future research.

DISCUSSION

Systematic reviews, based on their characteristics, were mostly conducted in developing countries, namely China (two studies) and Indonesia (one study). Meanwhile, studies conducted in developed countries included Hong Kong (Asia) and Sweden (Europe), each with one study. The findings identified existing studies related to health education that examined outcomes on self-care and self-efficacy in patients with coronary heart disease. The study revealed a method that can significantly improve self-care, namely, Diversified and Staged Health Education by Shan et al. (2020). The study describes the stages of the intervention, which involve active patient interaction in the process of increasing knowledge, assessing the effects of education, and emphasizing the importance of self-care, both face-to-face and through WeChat groups, thus contributing to the improvement of self-care abilities in coronary heart disease patient.

According to previous research (Gomes & Reis, 2019), a systematic and structured educational program strengthened the skills of patients with acute coronary syndrome. Both interventions exhibit similar stages, thus improving self-care. The initial stage is providing information and knowledge, followed by an educational video. The final stage is understanding the urgency of self-care and active information exchange via a mobile app, which allows for abnormality detection and effective intervention to prevent complications. This aligns with research (Nurati et al., 2024; Sandberg et al., 2024; Yang et al., 2025), which states that digital information and communication technologies that integrate practices through digital, innovative, and collaborative resources have proven effective as information sources, thereby increasing self-awareness about healthy lifestyles, and reducing mortality and suffering. In this approach, patients must use their ability to evaluate information well and make informed decisions about treatment and disease prevention (Lu et al., 2025).

Other findings indicate that the Workbook in Health Education by Nur'Aeni et al. (2019) is significantly effective in increasing self-efficacy in coronary heart disease patients. The research intervention involved learning and self-management implemented at home, guided by the guidelines for managing coronary heart disease patients, and supplemented with daily implementation notes that patients must complete at home. Similar findings indicate that interventions using the workbook method in the acute phase and two weeks after a heart attack also resulted in increased self-efficacy in managing symptoms, medication, and lifestyle changes (Shi et al., 2023). A self-help guidebook for home cardiac rehabilitation supports increased self-care activities while helping reduce risk factors, thus contributing to achieving the goals of cardiac rehabilitation: reducing morbidity, mortality, and readmission rates. By consistently adopting a healthy lifestyle, patients can also play a role in preventing coronary heart disease (Damluji et al., 2025; Zaree et al., 2023).

Another method that can improve self-efficacy is eHealth Cardiac Rehabilitation by Su & Yu (2021). The study described how the intervention was delivered through active interaction on WeChat. This approach comprehensively integrates information resources, motivation, lifestyle monitoring, and interaction, which can help patients gain knowledge about coronary heart disease management and monitor goal achievement as part of health behavior change efforts. This is in line with research (Candelaria et al., 2023), which reported that the impact of implementing digital cardiac rehabilitation can improve cardiac self-efficacy. This statement is reinforced by previous findings (Liang et al., 2022) that digital education, reminder features, and family support can increase patient engagement in adherence. Other studies have shown that cardiac telerehabilitation, allowing patients to undergo rehabilitation at home for ≥6

months, can improve health and quality of life and be cost-effective (Dibben et al., 2023; Zhong et al., 2023).

A method that did not show significant effectiveness in improving self-efficacy in patients with coronary heart disease was Problem-Based Learning by Kohler et al. (2020), in which heart patients selected their learning materials based on their preferences. Consequently, patients overestimated their self-reported activity levels. However, this study found positive effects in the form of weight loss, increased body mass index (BMI), and increased HDL cholesterol levels. Meanwhile, findings (Andreae et al., 2023) showed that a one-year problem-based learning intervention in heart patients had positive improvements in patient empowerment, nutritional status, and cholesterol levels. Empowerment enhancement focuses on patient behavioral strategies. However, another study (Mohamed et al., 2024) reported that the Learning-Based Program was beneficial in motivating patients, thereby increasing self-efficacy for heart patients.

Another method that did not show an increase in effectiveness on self-efficacy was Web-Based Education by Wong et al. (2020). The intervention taught heart patients how to use the eHES website. However, because patients were unfamiliar with computers or came from disadvantaged backgrounds, this method was ineffective in improving heart patients' self-efficacy. Different findings reported that a two-week web-based educational intervention involving visual, auditory, and kinesthetic learning had a positive effect on self-efficacy in cardiac patients (Vatmasari et al., 2025). This finding is in line with previous research (Rahmat et al., 2023), which showed that website use was proven to improve patient knowledge significantly and contribute to the prevention and management of heart disease.

Although technology-based health education interventions show potential to improve self-care and self-efficacy among coronary heart disease patients, their implementation should consider the characteristics of the target population, particularly the elderly and those from low socioeconomic groups. Limited digital literacy, decreased physical and cognitive function, and unequal access to devices and the internet can hinder the use of health technology and widen service gaps (Al-Dhahir et al., 2023; Chadwick et al., 2024). Therefore, eHealth programs need to be designed to be simple, easily accessible, and supported by families and healthcare professionals. Approaches that combine digital and in-person education can increase patient engagement and ensure that the intervention's benefits are more equitably shared (Bertolazzi et al., 2024; Hepburn et al., 2025). These findings are supported (Dewi et al., 2025), which showed that health education interventions through review sessions, educational videos, and face-to-face discussions were able to change beliefs, attitudes, subjective norms, and

supporting factors related to coronary heart disease. These changes in various behavioral determinants indicate that the combination of educational methods not only increased participant engagement in the learning process but also strengthened their understanding of managing risk factors for coronary heart disease. The heterogeneity of intervention methods limited this review, preventing direct comparison of results. Furthermore, primary research on interventions for coronary heart disease patients that emphasize self-care and self-efficacy outcomes is scarce.

CONCLUSIONS

This systematic review shows that health education has a positive effect on self-care and self-efficacy in patients with coronary heart disease, particularly through Diversified and Staged Health Education, eHealth Cardiac Rehabilitation, Workbook in Health Education. These findings emphasize the importance of patient-centered education as an integral part of coronary heart disease management to support self-care and prevent long-term complications. Therefore, structured, sustainable, and accessible health education programs need to be integrated into routine care, including through the use of digital technology tailored to patient needs. Further research with more standardized designs and long-term evaluation is needed to strengthen the evidence for the effectiveness of these interventions.

Policy Implications: Integration of eHealth and Diversified and Staged Health Education into standard coronary heart disease services is needed. Implementing this strategy has the potential to improve patient self-care and self-efficacy while supporting ongoing efforts to prevent complications and rehospitalization.

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